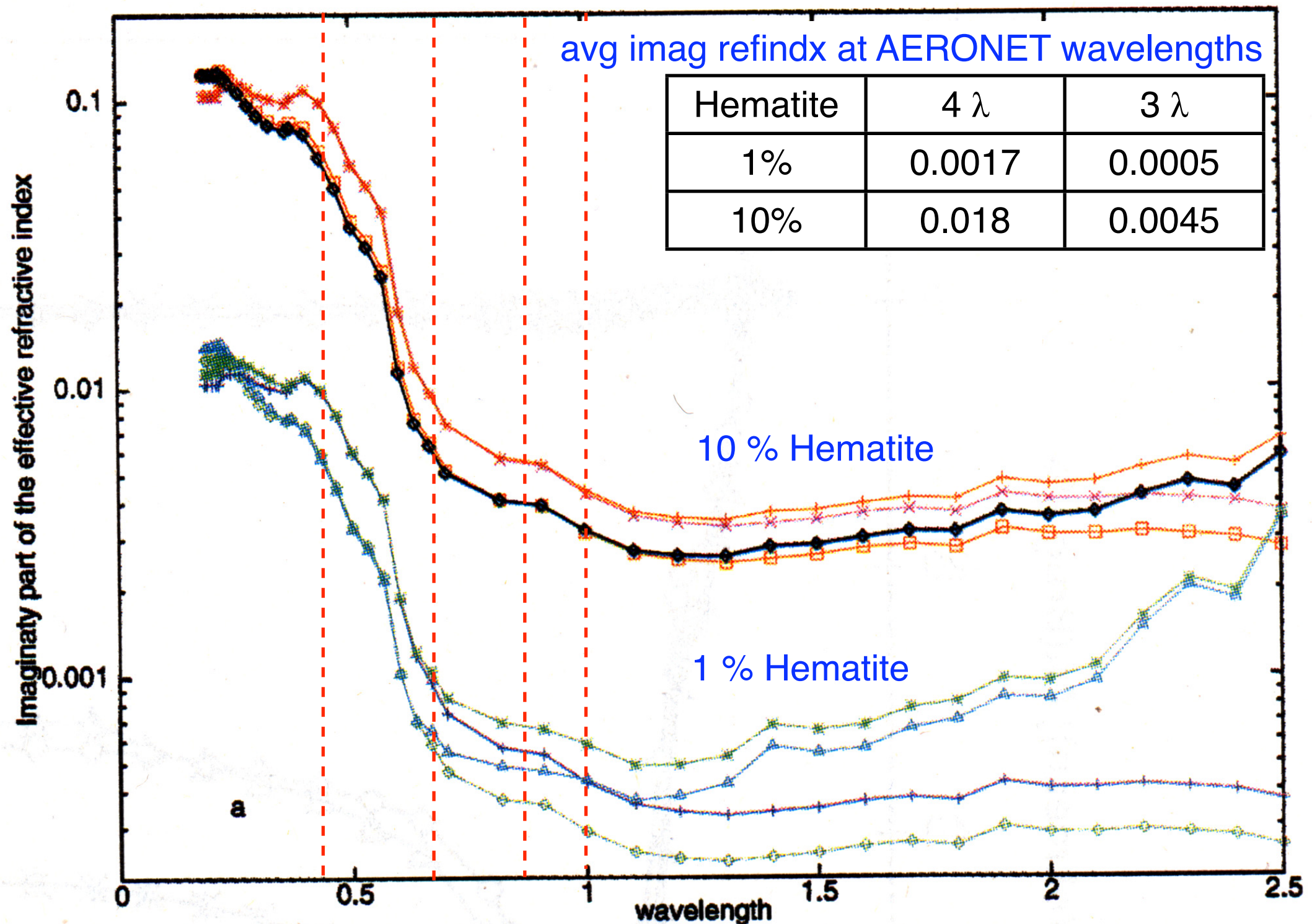


These slides demonstrate that the presence of dust and organic carbon perturbs the retrieved BC concentration by less than 15%.

Dust absorption is weak at all AERONET wavelengths, except 440 nm. The average absorption for all four retrieval wavelengths is weak as well.

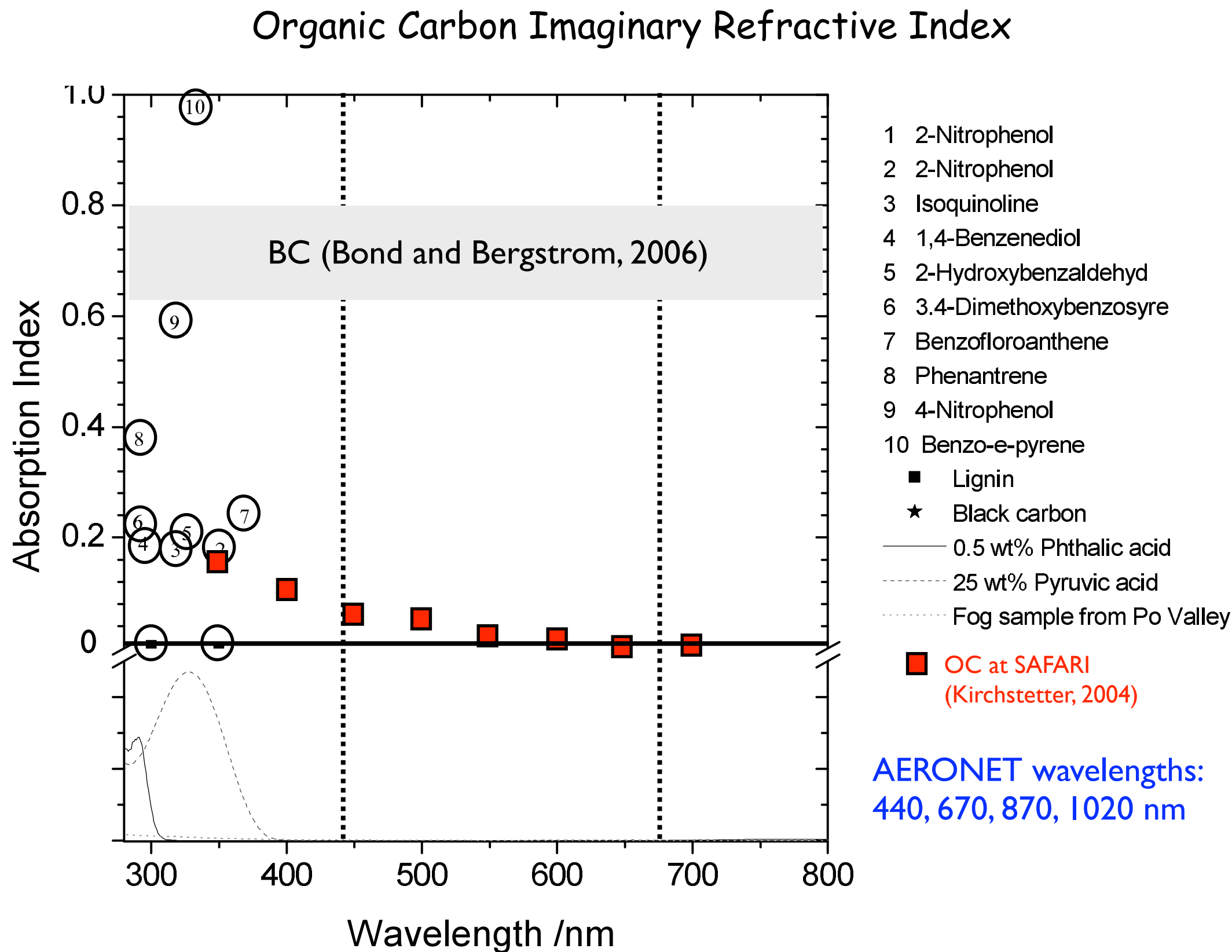
Imaginary refractive index of dust (Quartz or Kaolinite with Hematite)



*Sokolik and Toon (1999)*

- Avg refi w/ Bruggeman EMA at 4 AERONET wavelengths is 0.018 for 10% Hematite, 0.0045 for 3 longest wavelengths. Note that 10% represents a very large concentration of hematite.

# Organic carbon is not a strong absorber in the red or NIR, either

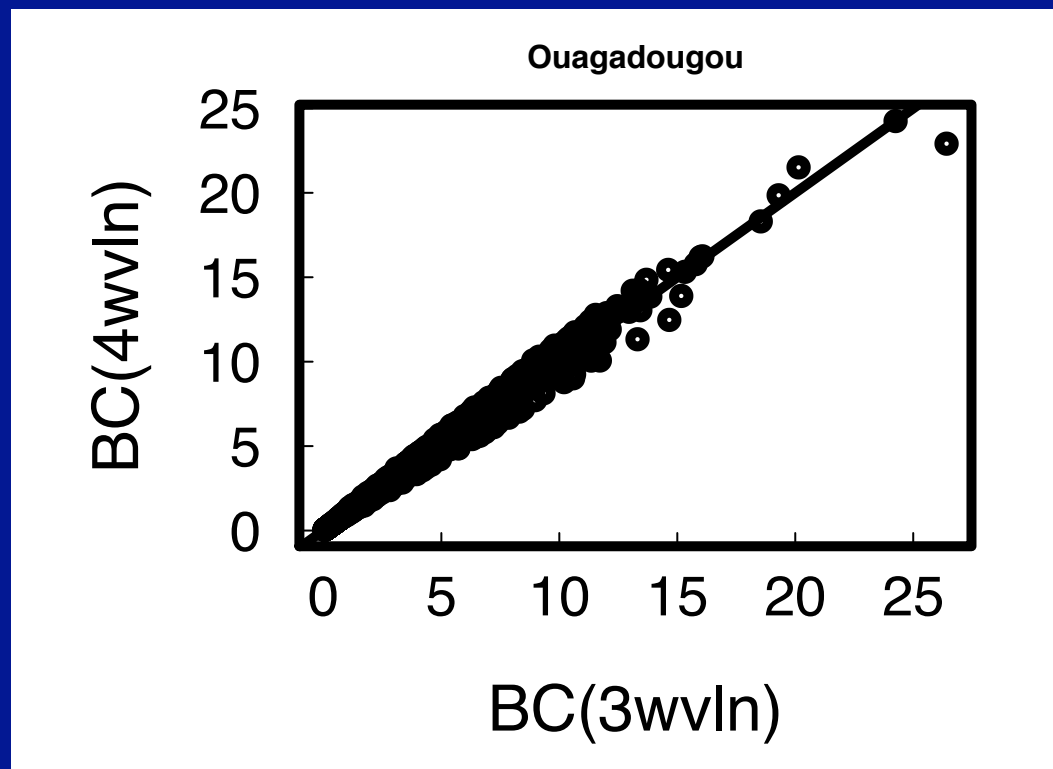


*Kanakidou (2005), Jacobson (1999)*

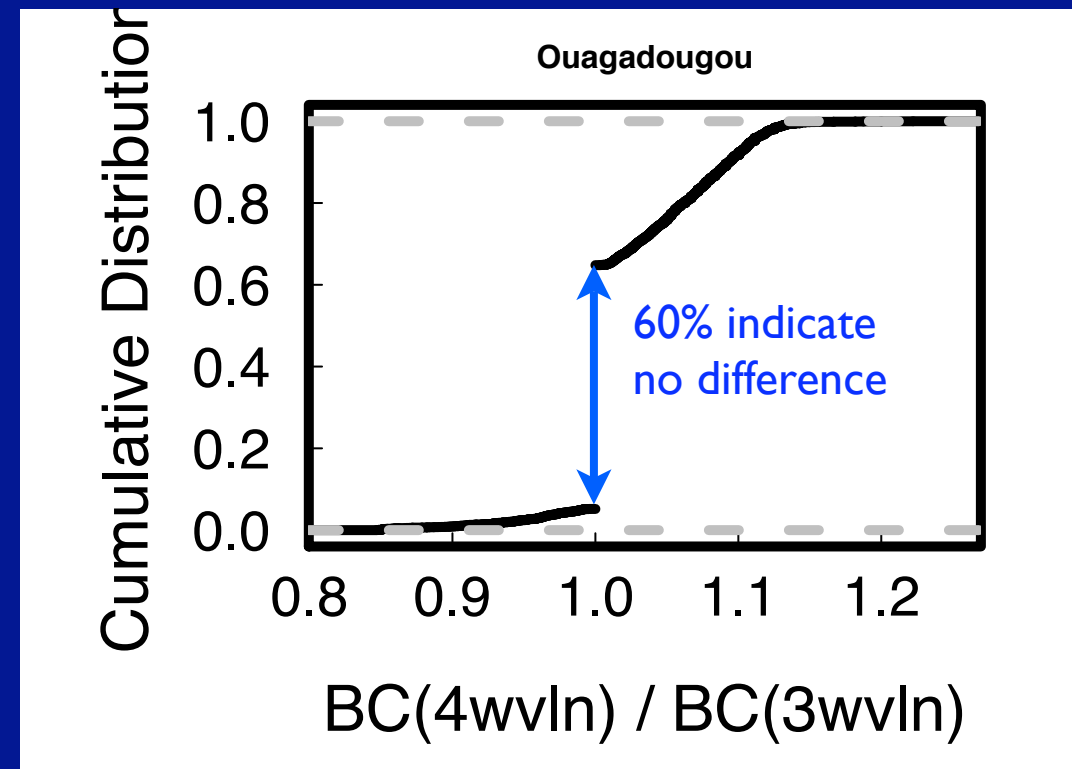
Numbers represent peak of OC absorption curves (ala Jacobson)  
 Avg Kirchstetter value for 4 AERONET wavelengths is 0.016, which is much much smaller than BC.  
 OC is essentially non-absorbing in the red and near infrared.

- Hence, a 3-component retrieval utilizing only the 670, 870, and 1020 nm wavelengths is not influenced by absorption associated with dust or organic carbon.
- We can compare the “standard” 4-component retrieval to a 3-component retrieval to determine the effect of non-BC absorbers on the BC retrieval.

Ouagadougou (North Africa) is known for continuous dust and seasonal biomass burning. The mean ratio of  $BC(4) / BC(3)$  is 1.02. Most of the retrievals (60%) do not indicate a significant discrepancy between  $BC(4)$  and  $BC(3)$ , and most of the retrievals indicate a discrepancy of less than 15%.



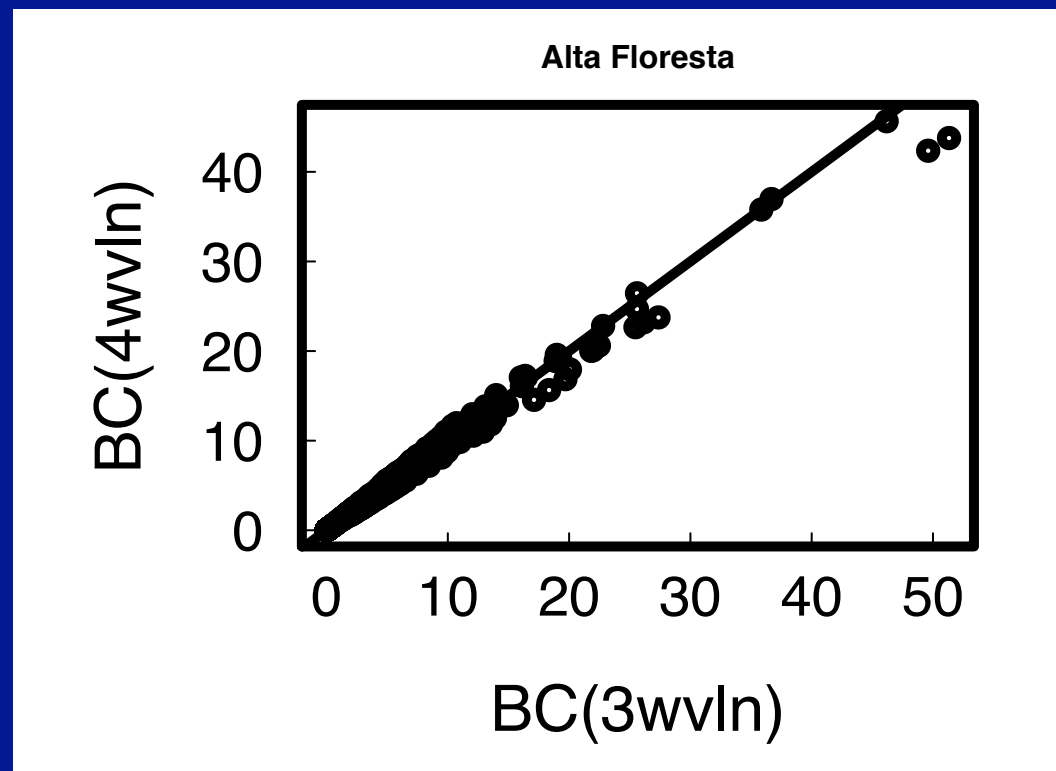
slope = 1.018  
 intcpt = 0.016  
 $R^2 = 0.9913$   
 N=5427



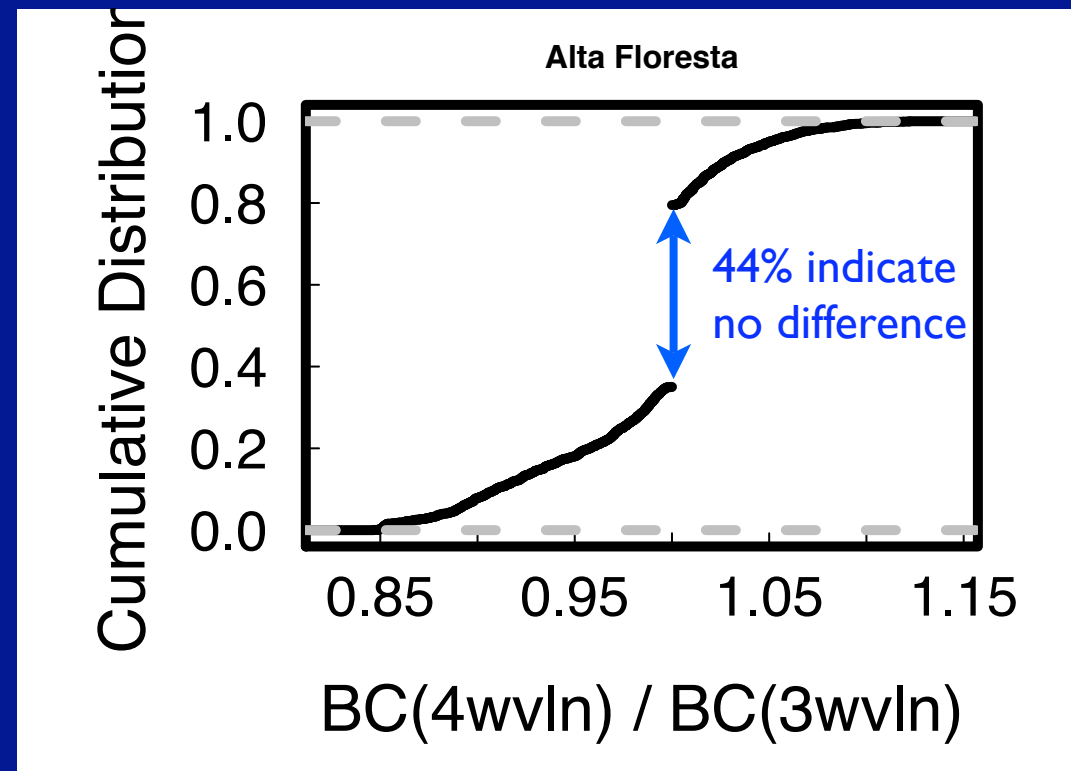
mean = 1.021  
 std dev = 0.044

Level 1.5,  $sza > 50$

Alta Floresta is a biomass burning site. The mean discrepancy is still less than 2%, and all of the discrepancies are less than 15%.



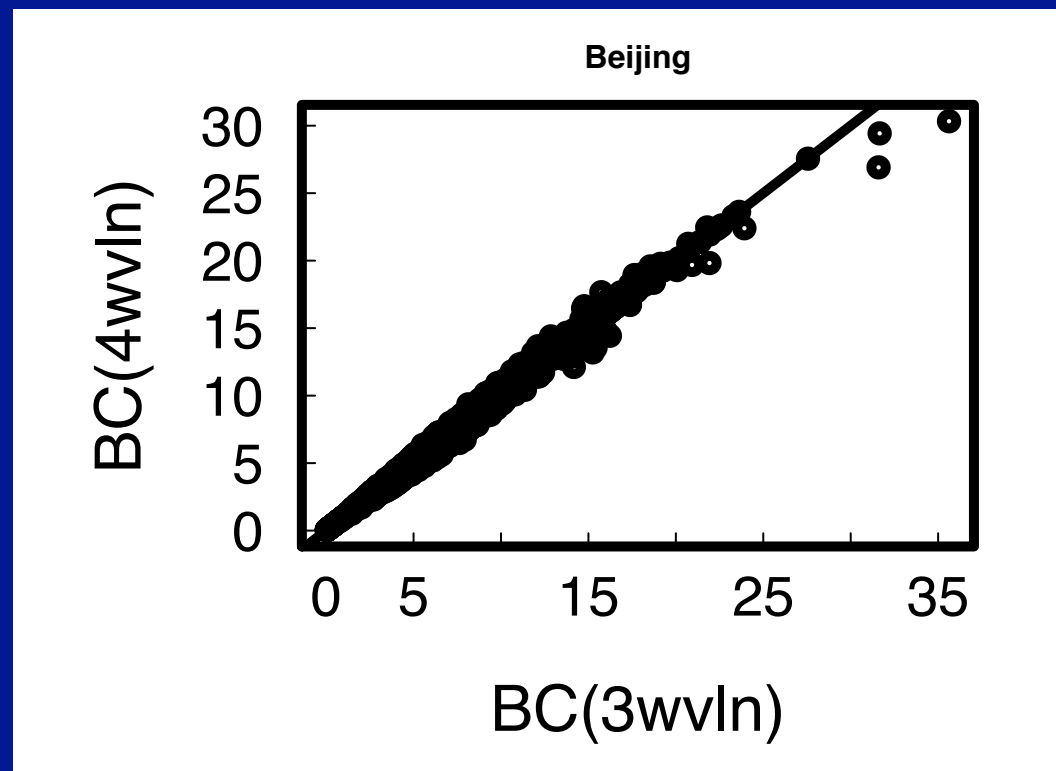
slope = 0.954  
intcpt = 0.076  
 $R^2 = 0.9916$   
N = 2390



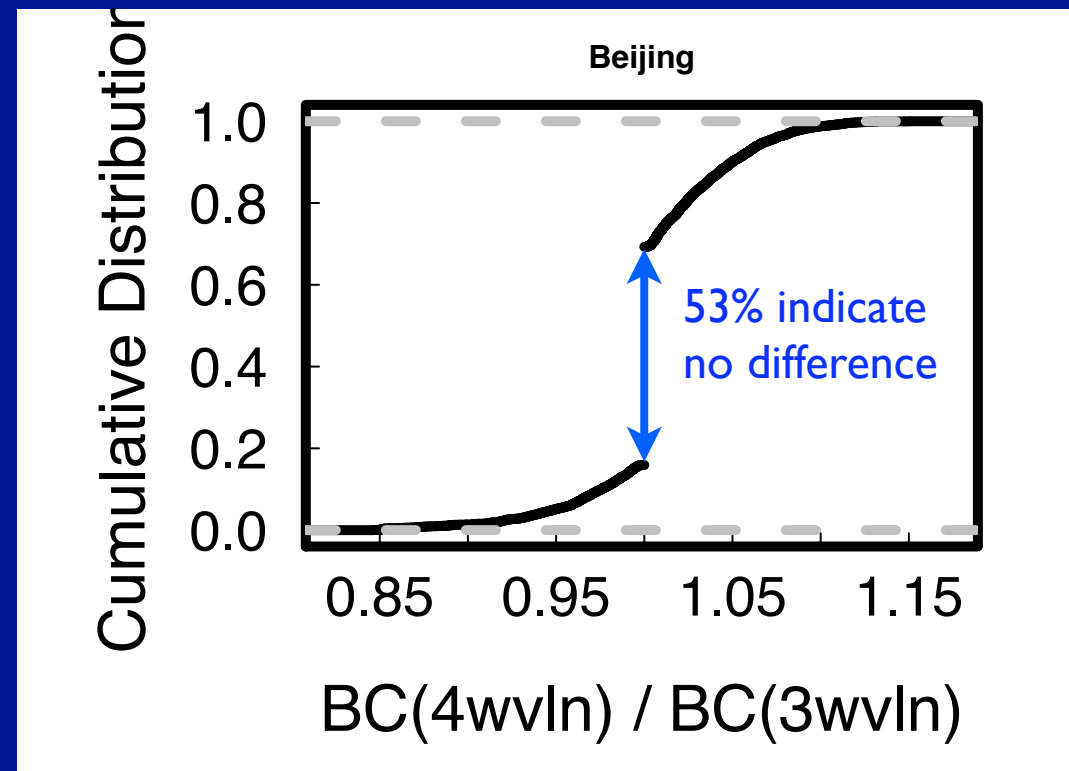
mean = 0.986  
std dev = 0.046

Level 1.5,  $sza > 50$

Beijing is heavily polluted, and also prone to dust events every Spring. The mean discrepancy here is less than 1%, and all of the discrepancies are less than 15%.



slope = 1.005  
intcpt = 0.013  
 $R^2 = 0.9956$   
N = 4464



mean = 1.005  
std dev = 0.035

Level 1.5,  $sza > 50$